

Office Action Summary

Application No.

10/582,271

Applicant(s)

MARSACQ ET AL.

Examiner

Kwang Han

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date 5/22/09.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

ALKALI FUEL CELL UNAFFECTED BY CARBONATION

Examiner: K. Han SN: 10/582,271 Art Unit: 1795 September 24, 2009

Detailed Action

1. The Applicant's amendment filed on May 26, 2009 was received. Claim 11 was amended.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. The claim rejection under 35 U.S.C. 103(a) as unpatentable over Landsman et al. in view of Hodgdon et al. on claims 11-13, 15-19, and 20 is withdrawn, because independent claim 11 has been amended.
4. The claim rejection under 35 U.S.C. 103(a) as unpatentable over Landsman et al. in view of Hodgdon et al. as applied to claims 11-13, 15-18, 20 and further in view of Yokoyama et al. on claim 14 is withdrawn, because independent claim 11 has been amended.
5. The claim rejection under 35 U.S.C. 103(a) as unpatentable over Landsman et al. in view of Hodgdon et al. as applied to claims 11-13, 15-18, 20 and further in view of MacDonald on claim 19 is withdrawn, because independent claim 11 has been amended.

6. Claims 11-13, 15-19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Landsman et al (US 5480735) in view Yao et al. (US 6183914) and Hodgdon et al (US 5118717).

Regarding claim 11, Landsman disclosed an alkaline fuel cell comprising two electrodes (anode 1 and cathode 2) each with active layers (figure 2) and an electrolyte-filled matrix (3). A flow of ions (hydroxide) flows through the electrolyte to complete the electrical circuit (1: 47-48). The catalysts layers are composed on the electrodes layers (cathode and anode) and oriented to toward the matrix (2:62-67; 3:1). Landsman et al does not disclose a solid membrane, but teaches the hydroxide ions passes through the electrolyte (and the matrix) (1: 47-48).

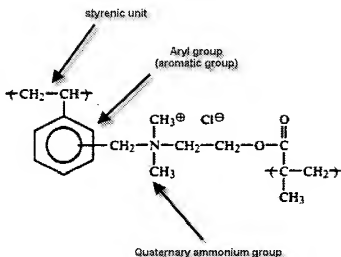
Yao teaches a polymer based solid electrolyte membrane for use in an alkaline fuel cell that relies on hydroxide anion transport [Abstract] to replace the liquid electrolyte (e.g. alkaline liquid) so it does not contain any corrosives or solvents which might react with seals or other portions of the fuel cell container and can have good film-forming properties and can form membranes having good flexibility, mechanical strength, and exhibit high conductivity (1:28-44; 3:45-63). It would have been obvious to one of ordinary skill in the art at the time of the invention use a solid electrolyte membrane to replace the alkaline liquid electrolyte of Landsman because Yao teaches the solid membrane does not contain any corrosives or solvents which might react with portions of the seals or container and can have good film-forming properties with good flexibility, mechanical strength, and exhibit high conductivity. Yao further teaches the electrolyte composition to comprised of an organic polymer backbone having an alkyl

quatarnary ammonium cation that is hydroxide conducting but is silent towards the polymer having vinylaromatic units.

Hodgdon teaches an anion exchange polymer having a vinylaromatic group, a quatarnary amino group with a chloride counter ion (see example 1). The reference states the membranes have physical or chemical resistance towards caustic degradation and organic fouling (2:33-40). Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the anion exchange membrane to conduct hydroxide ions in the electrode of Landsman modified by Yao, because Hodgdon teaches the anion exchange membrane is resistant to caustic degradation and organic fouling.

Regarding claims 12 and 13, Landsman does not explicitly disclose a polymer comprising styrenic units with a quatarnary ammonium group which conducts hydroxide ions.

Hodgdon et al disclosed an anion exchange membrane comprising styrenic units and quatarnary ammonium function group as shown in the figure below (example 1). The reference states the membranes have physical or chemical resistance towards caustic degradation and organic fouling (2:33-40). Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the anion exchange membrane to conduct hydroxide ions in the electrode of Landsman modified by Yao because Hodgdon teaches the anion exchange membrane is resistant to caustic degradation and organic fouling.



Regarding claim 15, Landsman teaches the porous substrate comprises of carbon paper, nickel or gold (3:7-15). Both electrodes employ platinum as a catalyst (3:30-65) as stated in instant claim 16.

Regarding claim 17, Landsman teaches the catalyst may comprise of platinum, gold, and silver (3:54-56). Since the porous substrate may comprise of gold, the catalyst layer is formed by the electronic conductive element.

Regarding claim 18, Landsman et al teaches the catalyst layer is supported by a mesh gold plated nickel screen (example 1, 6:1-5).

Regarding claim 19, the solid membrane of Landsman modified by Yao and Hodgdon would inherently have an ionic conductivity that is greater than or equal to 0.005 S/cm. The courts have held that claiming of a property or characteristic which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See MPEP 2112 and 2112.01. When the Examiner has provided a sound bases for believing that the

products of the applicant and the prior art are the same, the burden of proof is shifted to the applicant to prove that the product shown in the prior art does not possess the characteristics of the claimed product. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Regarding claim 20, Landsman et al teaches the catalyst layer is in between the matrix (3) and the electrodes (1, 2). Additionally, the electrodes are porous (3:7-9). Therefore, the Landsman et al combination teaches active layer is situated between a diffusion layer (electrode) and the solid membrane.

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Landsman et al., Yao et al. and Hodgdon et al. as applied to claim 12 above, and further in view of Yokoyama et al (US 4374924).

The teachings of Landsman, Yao and Hodgdon as discussed above are incorporated herein.

Regarding claim 14, Landsman, Yao and Hodgdon are silent towards the polymer formula with R' as shown in formula 2.

Yokoyama disclosed an antistatic layer comprising of a polymer (formula 1 in abstract). The reference teaches the material has low surface electric resistance (2:41-46). It would have been obvious to one of ordinary skill in the art to incorporate the polymer of Yokoyama in the fuel cell of Landsman, Yao, and Hodgdon because Yokoyama teaches the membrane has low surface electric resistance.

Response to Arguments

8. Applicant's arguments with respect to claims 11-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang Han whose telephone number is (571) 270-

5264. The examiner can normally be reached on Monday through Friday 8:00am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. H./
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795